SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Electrical & Civil Engineering
B. Tech. Minor-II, 2019-20

Entry No: 18BEE0211 Total Number of Pages: [01]
Date: 30-09-2019 Total Number of Questions: [06]

Course Title: Electrical Machine-I
Course Code: EEL 2321

Time Allowed: 1.5 Hours **Max Marks: [30]**

Instructions / NOTE

i. Attempt All Questions. Scientific Calculator is allowed in this paper.
ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
iii. Assume an appropriate data / information, wherever necessary / missing.

Q1.	Derive the equation for induced EMF on primary side and secondary side in a two winding single phase transformer.	[05]
Q.2	Draw and explain the phasor diagram of a transformer with winding resistance but no magnetic leakage with unity power factor load on secondary side.	[05]
Q.3.	The equivalent circuit for a 200/400-V step-up transformer has the following parameters referred to the low-voltage side. Equivalent resistance 0.15 Ω ; Equivalent reactance 0.37 Ω Core-loss component resistance 600 Ω ; Magnetising reactance 300 Ω When the transformer is supplying a load at 10 A at a power factor of 0.8 lag, calculate the primary current.	[05]
Q.4.	Determine the core area, the number of turns and the position of the tapping point for a 500-kVA, 50-Hz, single-phase, 6,600/5,000-V auto-transformer, assuming the following approximate values : e.m.f. per turn 8 V. Maximum flux density 1.3 Wb/m^2.	[05]
Q.5.	Explain fully with help of diagram *scott* connection in transformer and why we need this connection?	[05]

Q.6.	A 100-kVA, 3-phase, 50-Hz 3,300/400 V (Line voltage) transformer is Δ-connected on the h.v. side and Y-connected on the l.v. side. The resistance of the h.v. winding is 3.5 Ω per phase and that of the l.v. winding 0.02 Ω per phase. Calculate the iron losses of the transformer at normal voltage and frequency if its full-load efficiency be 95.8% at 0.8 p.f. (lag).	[05]